



THE EIGER.

THE MÖNCH.

THE JUNGFRAU TUNNEL.

By F. W. WENDT.

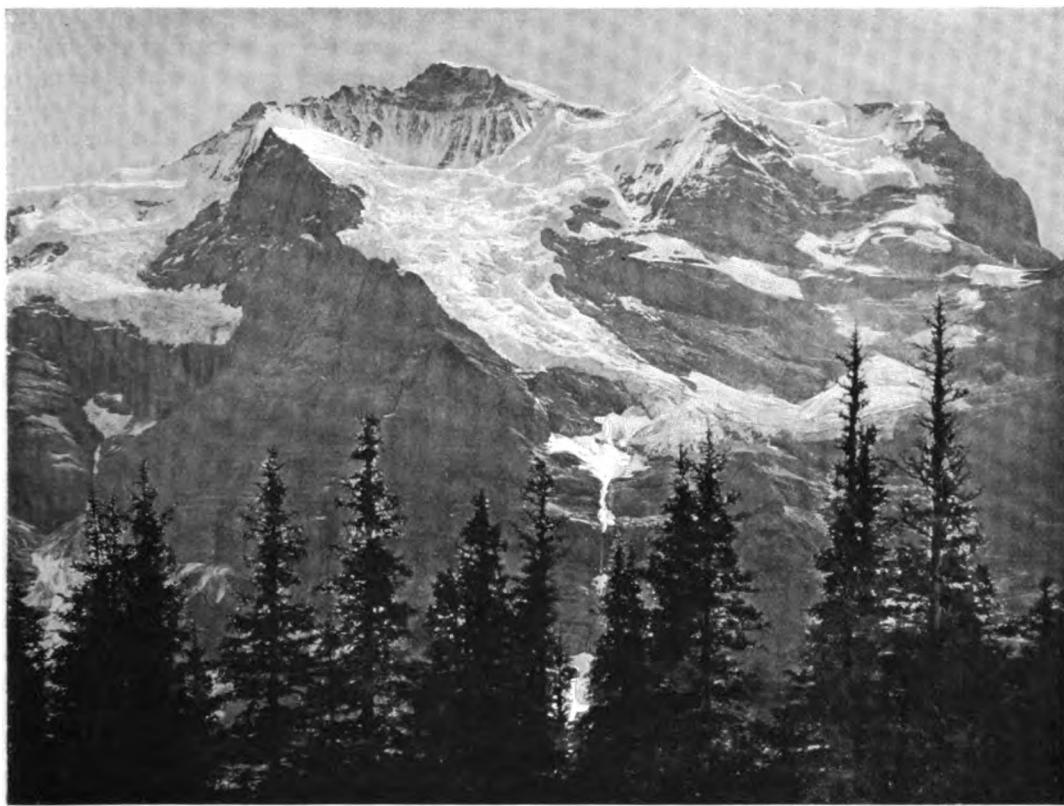
"YES, pretty rough trip," Uncle Tom called back, leaning over the railing of the steamer that had brought him home again. And in truth it must have been; for when May and Harry, standing on the pier, looked up at the huge black funnels, they saw large white salt-patches clinging to the very top, showing that the ocean had climbed away up there.

On the evening of Uncle Tom's arrival, a merry little family party had gathered around the Marston tea-table. The red-shaded lamp in the middle of the table, among steaming biscuits and delicacies of every kind, threw a fine, cheery glow over everything. Even the sing-

ing tea-kettle bubbled and chuckled, and danced its little cover up and down in high glee, because Uncle Tom had come home again from Europe. When he came from abroad he always had news and stories to tell, which May and Harry enjoyed as much as their parents, Dr. and Mrs. Marston.

"Well, Tom, how fares the world on the other side of the Atlantic, and what news can you tell us?" asked Dr. Marston.

"The most interesting novelty I have found is a plan to take a railroad excursion through a tunnel to the very tip-top of Europe amid snow and ice," answered Uncle Tom.



THE JUNGFRAU.

"Whew — w — w!" said Mrs. Marston with a little shiver; "how cold and wet and tiring that must be."

"Not if you go in the grand way proposed by the Swiss engineer, Herr Guyer-Zeller. You get into a comfortable car in the valley, and without the least exertion on your part you slide up, up, up to one of the highest and most beautiful snow-peaks of Switzerland, the Jungfrau Mountain. Around you and below you lies a magical panorama of ice and snow, while in the distance you may see the landmarks of three great nations: Monte Rosa of Italy, Mont Blanc of France, and the Black Forest of Germany."

"Why, you talk just like a guide-book, Uncle Tom!" said May.

"Then I am making a mistake, because guide-books are seldom interesting. First class in Geography, stand up. Now, Miss May, I am going to start in by asking questions. Do you

remember when we were all at Interlaken two years ago?"

"Oh, yes!" said May; "and the big white mountain that looked like a piece of sugar, right in front of the hotel."

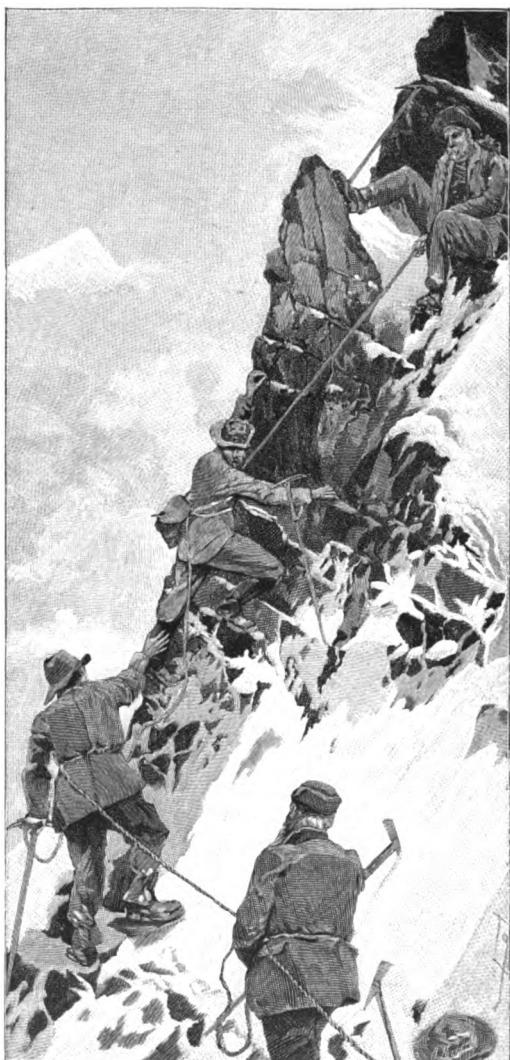
"Yes, I see you remember. Only that big white mountain, the Jungfrau, is miles away from the hotel, and even at that distance it looks very, very high. It is about 13,000 feet."

And then Uncle Tom explained to them all how Swiss engineers had thought it would be a great thing to give any one who cared to go a chance to reach a place where snow and ice never melt all the year round, and to look down from that tremendous height and see what a beautiful world this is.

"Now bring your map of Switzerland, May, and I will show you just where all this is to happen."

"And I am going to help clear away the tea-things. Then we can make believe that the

The illustrations on this and the preceding page are from photographs by the Photo-chrom Co., Detroit, Mich.



ALPINE CLIMBERS.

table is Switzerland," said Mrs. Marston, "and Uncle Tom can take us with him and point out places on our make-believe Switzerland."

Uncle Tom went out, and when he came back with a large package of photographs under his arm, he found everything ready for the "trip." The rough, dark-green tablecloth was a fine ground to build upon. Large and small plates were to represent cities, and cups of different sizes were ready to be put into the proper places as snow-covered mountains.

"Ah! here we are," cried Uncle Tom. "Now, ladies and gentlemen, we will take you

up higher than you have ever been in your life. All aboard! — we start from Interlaken.

"On the map, you see, Switzerland looks like a large, irregular ink-blot, squeezed in between France, Germany, and Italy. Its boundary-line is very ragged, little tails and legs and fringes sticking out all around. But our green, oblong table will do well enough." Uncle Tom took up two large plates. "Now find Berne and Lucerne on the map, and put the plates on the correct places on the table."

Harry and May, after a little study of the map, laid them in their proper positions. Then they found Interlaken, and marked that site, too, with a small saucer. The three formed a triangle in the middle of Switzerland, with one of the corners, marked by the Interlaken saucer, pointing south.

"That is to show us exactly where we are," said Uncle Tom. "Now below Interlaken we will place three 'tea-cup mountains.' The one on the right is the Eiger, the next one, to the left, touching it, is the Mönch, and the largest one, to the left of the Mönch, is the Jungfrau.

"A train leaves Interlaken early in the morning and takes us through the beautiful Lauterbrunnen valley. Then we have to change cars and get into a funny little combination composed of one car and a small locomotive. This strange train pushes and puffs up the steep incline with us, and gives us a fine view of the mountains — the Eiger, Mönch, and Jungfrau — the mountains which are to be pierced by the great tunnel through which the ascent is to be made.

"Every minute the scenery changes. The river below and the chalets grow smaller and smaller, and finally, as we look down, appear like Noah's-ark villages.

"We have reached Scheidegg, the last station at present, and the beginning of the great railway that is to be built. We are very high, about 6300 feet, but as yet we seem to be only at the foot of the three mighty mountains that you can see in this large picture. The one farthest to the left is the Eiger, where the tunnel is to begin. Then comes the Mönch, and the largest one on the right is the Jungfrau. Here also is the plan that shows you exactly what the engineers are going to do."

Uncle Tom placed a tracing beside the photograph. "Do you see that dotted line?" he asked. "That is how the tunnel is going to be built. Where it begins on the left is the farthest point you can now reach by rail — Station Scheidegg, as I have told you.

"One day I walked up toward the point where the engineers propose to begin the tunneling. Pickaxes and powder and dynamite will slowly march ahead of them and open the passage for present and future generations. First into the very heart of the Eiger mountain; then, after a sharp right-turn, through the next mountain, the Mönch; still on, under the glaciers and ice and snow fields, to the center of the Jungfrau, to within about 200 feet from the top, directly under the highest peak. A large circular shaft will be run vertically from here to the summit. There will be steps going up this shaft, but as two hundred feet is a pretty long climb by means of a stairway, a large elevator will shoot up and down, and whirl people from the dark interior of a mountain into the dazzling sunlight of the most heavenly Swiss panorama."

"Why, that is like 'Arabian Nights' and 'Aladdin'!" exclaimed May.

"You are quite right, May; people do things now that seem more incredible than the feats accomplished by the slave of Aladdin's Wonderful Lamp," said Uncle Tom.

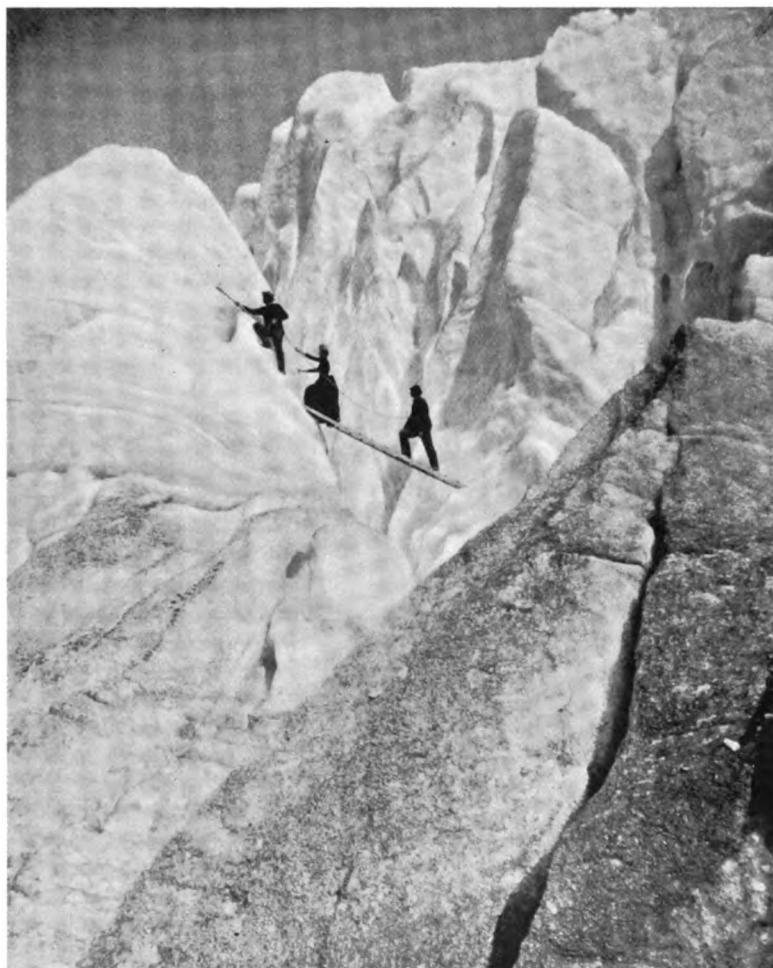
Harry had been thinking and wondering.

He was a bright lad, and always wanted to know the why and wherefore of things.

"How long is that whole tunnel going to be?" he finally asked.

"Over six miles."

"And the train goes uphill under ground



HOW THE MOUNTAINS ARE CLIMBED TO-DAY. CROSSING A CREVASSSE.

all the time, does n't it; and has to go very slowly?"

"Yes."

"Then," said Harry, "I don't think I would like to creep around in darkness, inside of a mountain, like that, and not see a thing."

"You are right, my boy; but it will not be necessary. Every fifteen minutes there will be a large, roomy station, with great windows cut

into the mountain side, from which there will be a view of fairyland even before you get to the tip-top. And nobody will be asked to go on to the end unless he likes.

"Now, I am going to show you how people used to, and still do, climb to the top of the Jungfrau." Uncle Tom drew out other pictures,—pictures of snow and ice with a few

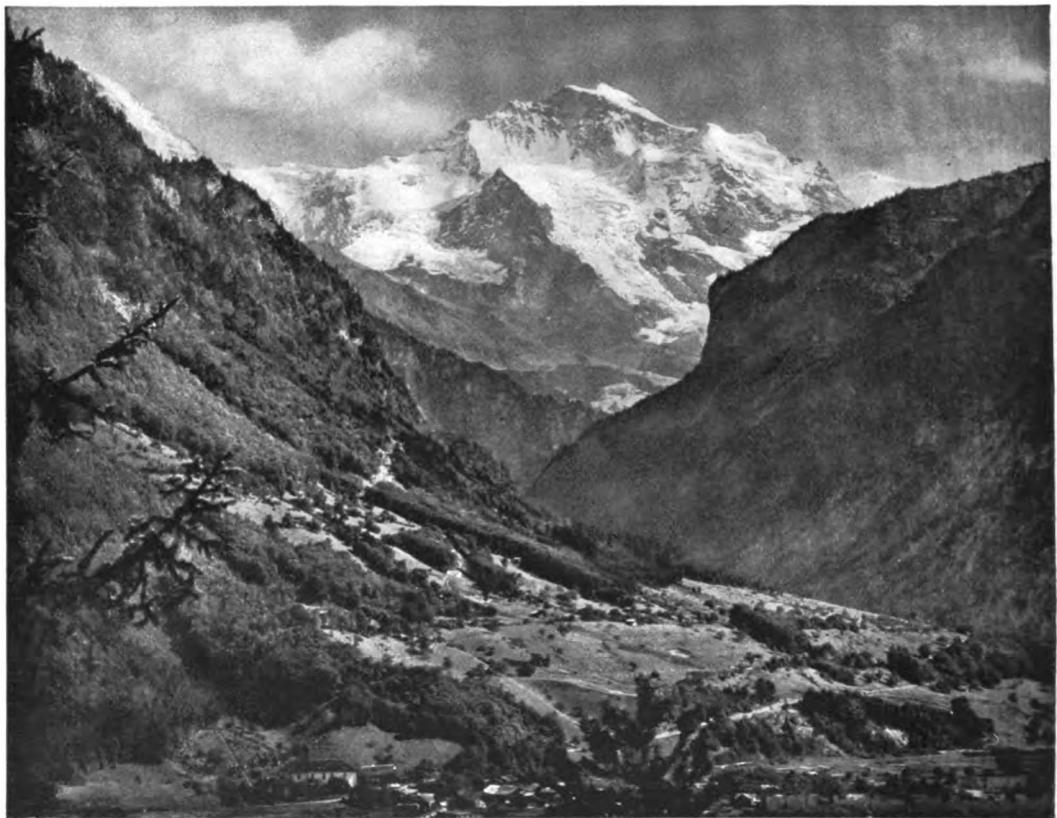
time is carried to view a panorama that few, until then, have ever seen or dreamed of."

Uncle Tom paused. Dr. Marston was blowing large rings of smoke from his cigar.

"Well, Tom," he said, "that is all very beautiful, but it is not practicable."

"Why not?"

"Because, in the first place, anybody who



FROM PHOTOGRAPH BY PHOTO-CRÖM CO., DETROIT, MICH.

THE JUNGfrau, FROM THE RUGEN, NEAR INTERLAKEN.

people climbing up across the crevasses. "One wrong step," said Uncle Tom, "and they go shooting down thousands of feet. But not only that: the exposure and the cold are terrible, and many people have, as a result, lost their lives. It takes several days to make the perilous ascent and descent, and only experienced and hardy mountain-climbers, with the aid of skilled guides, dare attempt it.

"And now see how all changes when the railroad is built: One takes a comfortable seat in a car driven by electricity, and in a short

suddenly rises to that altitude, about 13,000 feet, would become very ill through the change in the air-pressure."

"Yes, most people would become ill if they *climbed* up, but not if they were *carried* up. It is not only the rarefied air that affects them, but the exertion of the climb uses up the oxygen in the blood, and that of course makes people more susceptible and ill."

"How can you prove that?" asked Dr. Marston. "No one has ever been taken up there yet without climbing."

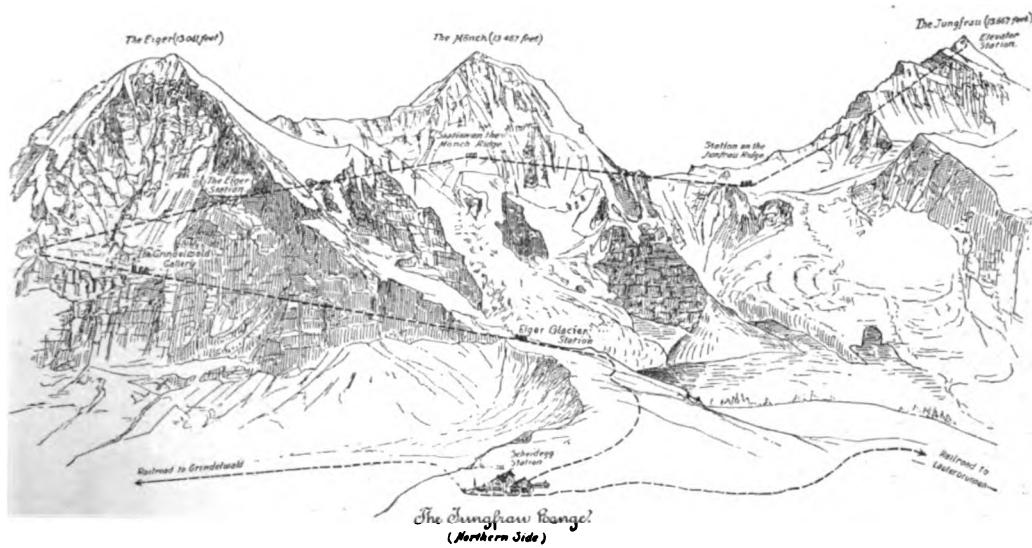


DIAGRAM OF THE PROPOSED JUNGFRAU RAILROAD.

"No," said Uncle Tom; "we can only reason it out; a very ingenious experiment has been made with guinea-pigs."

"With guinea-pigs!" called out little May. "Is n't that funny?"

Then Uncle Tom told the children how scientific men had proved by means of animals that the sickness that overcomes most people at great heights is due as much to exertion as to the altitude. Guinea-pigs were chosen to experiment upon; and as it would have been difficult actually to take them up the Jungfrau Mountain, a very clever scheme was found to produce the same conditions.

"Air, light as it may seem, weighs fifteen pounds a square inch at the level of the sea. The higher we rise the lighter or more rarefied it becomes. This we must fully comprehend to understand the experiment. To begin with, we shall need a large glass bell-jar, one from which the air can be pumped. We can tell exactly how light the air under the jar is at any moment by the instrument connected with it." So saying, Uncle Tom showed a picture of the apparatus.

"It looks like a thermometer," said May.

"It does; and it is a similar instrument, called a 'manometer,' or measurer of the pressure of gases, such as air. Under the jar there is a

wheel, like the wheels that we have seen squirrels play in. By means of electricity they can make this wheel revolve slowly or quickly.

"And now our experiment begins. We put two guinea-pigs, called 'John' and 'Jim,' un-

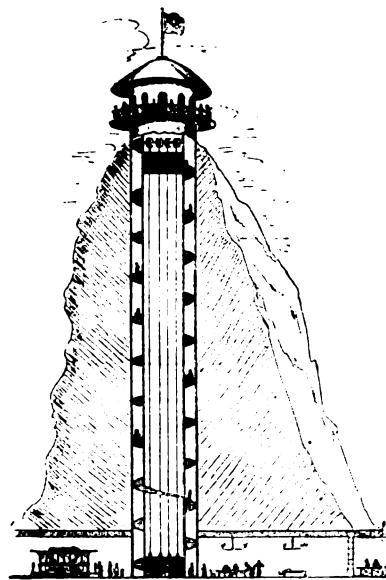


DIAGRAM OF THE SPIRAL STAIRCASE AND ELEVATORS TO THE SUMMIT OF THE JUNGFRAU.

der the glass jar. John, however, is placed in the wheel, while Jim is allowed to lie down

quietly wherever he pleases under the jar. We then start the wheel going in the direction of the hands of a clock, and so if John does not move his legs and walk forward, the wheel by its motion carries him backward and up. So poor guinea-pig John has to trot forward as fast as the wheel-floor under him moves backward. We know exactly the size of the circumference, and by a sort of cyclometer we can tell how far we have made John run in the wheel. By slowly pumping out air at the same time, we produce the same conditions as if John were running up a mountain — up the Jungfrau. As soon as the air becomes as light as it would be on a mountain 12,000 feet high, poor John begins to show signs of weariness, and when we keep on and make him go higher still, to 14,000 feet altitude, he falls on his back and is no longer able to move. Jim, on the contrary, in the same light atmosphere, is quite well, as he has made no exertion. If, however, we go on rarefying the air until it is as if at the altitude of the Himalaya mountains, 24,000 feet, Jim too succumbs.

"This little experiment proves that a living being *carried* up to a reasonable height will suffer little discomfort, while the one who *climbed* to that altitude will in most cases become ill. If a human John climbs up the Jungfrau around the outside through snow and ice, and a human Jim rides up comfortably through the great proposed tunnel, Jim will very probably have a good time and enjoy the view when he gets to the top, while poor John will feel exhausted and ill — 'mountain-sick,' as it is called."

"It seems to me," said Mrs. Marston, "that your tunnel and railroad will do much to drive the poetry out of the Swiss mountains."

"Perhaps, for the very few who are able to climb up by means of the alpenstock, that is true," agreed Uncle Tom; "but it will create poetry and show the sublime in nature to thousands of men and women and children who cannot and dare not go there now."

The cheerful fire in one corner of the room had gone on crackling all the evening, unmindful of the fact that the family were away with Uncle Tom on their make-believe trip to Swit-

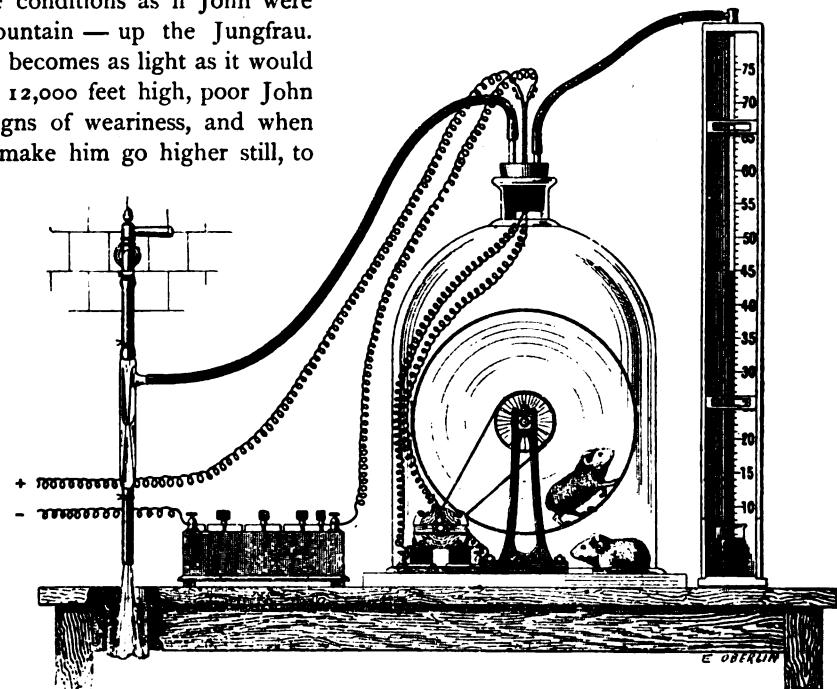


DIAGRAM OF THE EXPERIMENT WITH THE GUINEA-PIGS.

erland. May alone had gone to keep it company, and sat upon the polar-bear skin in front of the old-fashioned hearth, staring into the fire, where, she had declared, the logs looked exactly like the Jungfrau Mountain shown in the photograph.

Suddenly the great, tall clock in the corner of the room struck eleven. The familiar sound brought Uncle Tom and his party back from the top of the Jungfrau to the cozy dining-room — all but May. May's curly little head was resting upon the thick bear-skin; she had traveled farther than any of them — for she had made the journey to Dreamland.